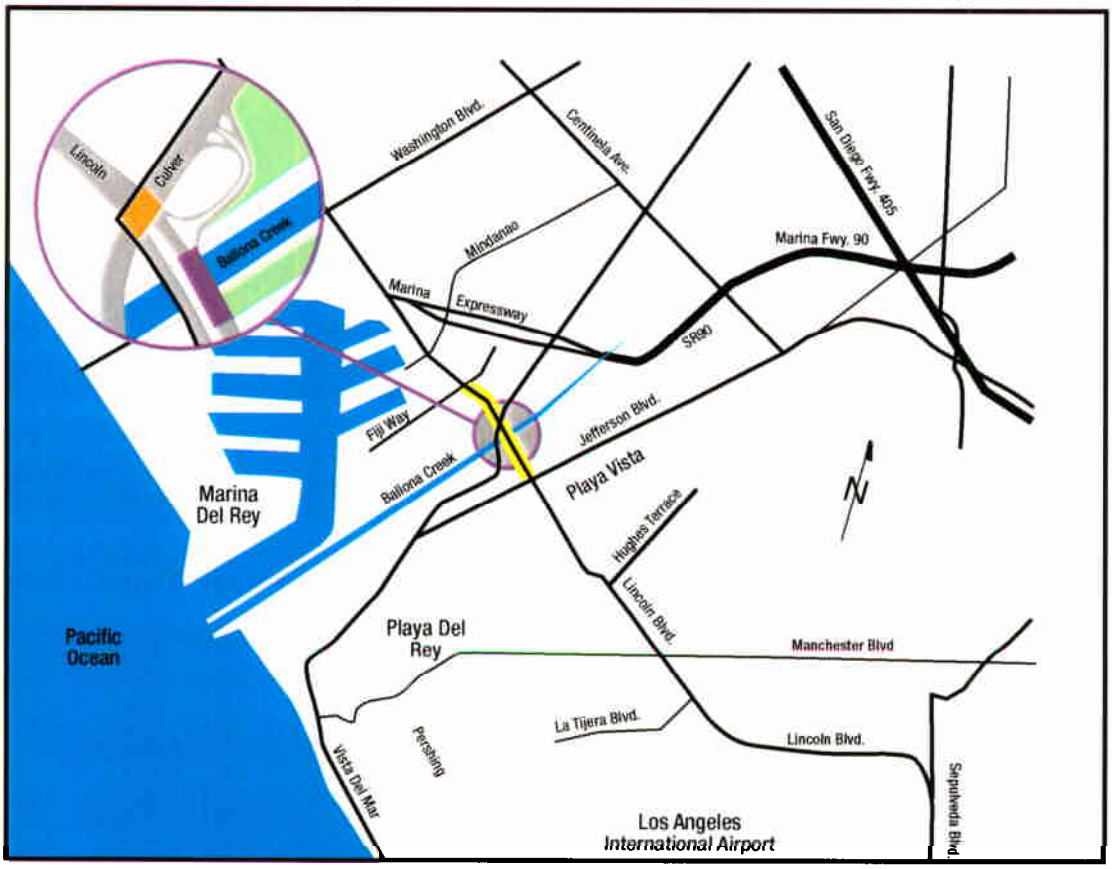
Route 1 (Lincoln Boulevard)

Widening from Jefferson Blvd. to Fiji Way, Construction of a New Bridge over Ballona Creek, and Replacement of the Culver Blvd. Overcrossing

Draft Initial Study/Environmental Assessment (IS/EA)



California Department of Transportation
Los Angeles, District 7
Office of Environmental Planning

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3. AFFECTED ENVIRONMENT

3.1 Introduction

The project is located on Route 1 (Lincoln Boulevard) in Los Angeles County. Route 1 is the main transportation corridor connecting the South Bay cities and LAX to Marina del Rey, Venice, and the City of Santa Monica. The project section of Route 1 traverses a moderately urbanized area of West Los Angeles between Jefferson Boulevard and Fiji Way.

3.2 Topography

The topography of the project area is generally flat and slopes gently. The project area does not contain unique geologic features.

3.2.1 Geology

Regionally, the project site is located within the Los Angeles Basin, which is situated at the juncture of the Peninsular Range and Transverse Range Provinces. The Los Angeles basin is divided into distinct structural blocks separated by major faults or flexures. Route 1 is located within the west side block, southwest of the Newport-Inglewood fault zone.

3.2.2 Soils

Route 1 is situated entirely over alluvial sediments, consisting of gravel, sand, silt and clay. The project site is composed primarily of Late Pleistocene alluvial dune sand consisting of well-sorted wind-blown sand; Late Pleistocene Lakewood Formation consisting of mainly river channel and floodplain deposited gravel, sand, sandy-silt, silt and clay; Early Pleistocene San Pedro Formation consisting of mainly near-shore marine gravel, sand, sandy-silt, silt and clay; and Pliocene Pico Formation composed of bedrock.

3.2.3 Seismicity

The project is located in a seismically active area. The geologic processes, which have caused earthquakes in the past, can be expected to continue. Seismic events, which are likely to produce the greatest bedrock accelerations, could be a moderate event on the Newport-Inglewood fault zone, and/or a large event on a distant active fault.

Ground shaking from a moderate earthquake along this or other distant earthquake fault would have the greatest potential damage to this project. The potential of liquefication is also present. Liquefaction exists when fine silts and sands are located below the water table. The water can also be perched ground water. Liquefaction has been documented to affect soils to $\pm$ 15 m. (50 feet) deep, during prolonged periods of ground shaking.

A fault is considered active by the State of California if geologic evidence indicates that movement on the fault has occurred in the last 11,000 years, and potentially active if movement is demonstrated to have occurred in the last 2 million years.

Recent studies along the "Playa-Vista" Development have postulated a fault (inferred) based on soil-gas and ground water anomalies. Final comments and conclusions have not yet been completed. However, preliminary conclusions from Ms. Tania Gonzalez, Certified Engineering Geologist (Earth Consultant International Inc.) and leading researcher on this fault investigation, states that based on the existing data collected, it indicates that there is not - an earthquake producing fault (pers.comm. 10-2-2000). In addition, at the present time and pursuant to the Alquist-Priolo Earthquake Fault Zoning Act, this inferred fault has not been zoned (J. Treiman, CDM&G, pers. comm. 9-27-2000).

3.3 Hydrology

3.3.1 Surface Water

The project area lies within the Los Angeles River Basin of the State Water Resources Control Board. Specifically, the project is located within the Ballona Creek Watershed. The watershed drains an area that is 130 square miles (209 km^2) and is shown in Figure 4. The Ballona Creek Channel is the major drainage channel in the site vicinity, and one of the largest drainage channels entering the Santa Monica Bay. The 78,000-acre Ballona Creek Watershed is heavily urbanized, encompassing portions of the Santa Monica Mountains to the north; an area west of Beverly Hills and the higher elevations of Culver City to the west; an area extending to downtown Los Angeles to the east; and the Westchester Bluffs to the south. There are no wild and scenic rivers present in the project area.

3.3.2 Floodplain

Flood plain boundaries have been delineated on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). As identified on the FIRM, several different types of flood hazard areas including Ballona Creek Channel are traversed:

Zone A- Contained in channel
Zone B- Areas between limits of the 100-year flood and the 500-year flood
Zone C- Areas of minimal flooding

The Ballona Creek Channel was identified to be in Zone A-Contained in channel. It is one of the four major streams in southwestern California. It is a federally constructed flood control facility that was included in the Los Angeles County Drainage Area (LACDA) Project in Los Angeles County. It is operated and maintained by the Los Angeles County Flood Control District (LACFCD), and crosses Route 1 (Lincoln Boulevard) within the project limits. The Ballona Creek Channel crosses Rte. 90 approximately 2,000 feet north of Jefferson Boulevard.

The area located immediately south of Ballona Creek was shown on the FIRM to lie within Zone B and C, areas between limits of the 100-year flood and 500-year flood and areas of minimal flooding.

3.3.3 Groundwater

The project site lies within the Santa Monica hydrologic sub-area of the Coastal Plain of Los Angeles. Regional ground water levels are at or near sea level. The three aquifer systems

Ballona Creek Watershed

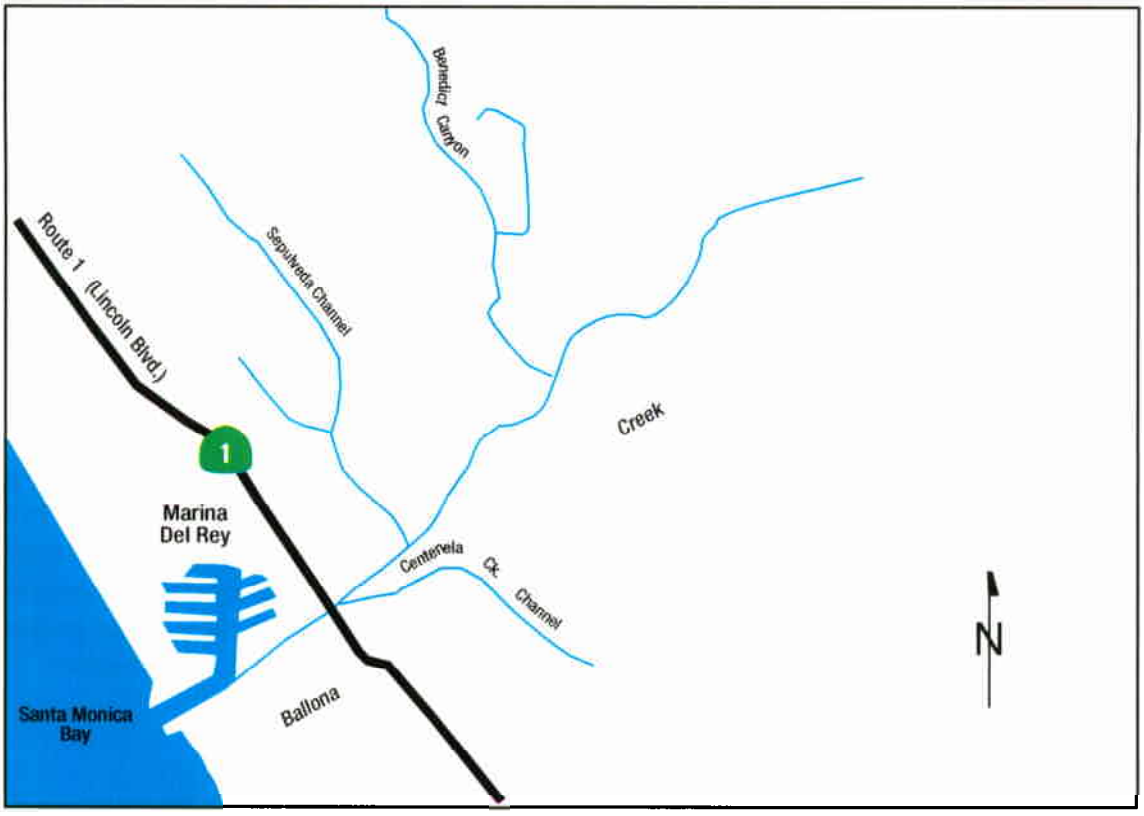

Figure 4

beneath the project site and vicinity area are, from greatest to least depth, the Silverado Aquifer, the Gage/Gardena Aquifer and the Ballona Aquifer system (which includes the Ballona Aquifer and the Bellflower Aquitard). There is no known extraction of ground water for beneficial uses from any of the three aquifer systems underlying the project area. No records of any groundwater monitoring or testing were found in the vicinity

3.4 Air Quality

3.4.1 Air Basin and Air Quality Issues

California is divided by the California Air Resources Board (CARB) into air basins that share similar meteorological and topographical features. The project is located in the South Coast Air Basin (SCAB or Basin), a 17,094 square kilometer (6,600 square mile) area comprised of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The Basin is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. Within the Basin, the climate is Mediterranean and characterized by mild, sunny winters with occasional rain and warm, dry summers. There can be pronounced differences in temperature, humidity, cloudiness, fog, rain, and sunshine over short distances. Prevailing wind direction is from the southwest, but from October to March, intermittent hot, dry winds also known as the "Santa Ana's" sweep in from interior desert regions.

The Clean Air Amendments of 1990 require that transportation plans, programs and projects which are funded by or approved under Title 23 U.S.C. or Federal Transit Act conform to state or federal air quality plans. In order to be found in conformance, a project must come from approved transportation plans and programs and the Regional Transportation Improvement Program (RTIP). A necessary pre-requisite for inclusion in the RTIP is that the project must have been modeled in the regional model run for its emissions effects. See Section 5 for air quality analyses and conformance statement.

3.4.2 Regulatory and Planning Requirements

Air quality has been regulated at the federal level under the federal Clean Air Act (CAA) since 1970. This act authorizes the EPA to set National Ambient Air Quality Standards (NAAQS) for air pollutants of nationwide concern. The act also requires each state to submit a State Implementation Plan (SIP) detailing the state's strategy for achieving the national standards.

The Basin's climate and topography are highly conducive to the formation and transport of air pollution. The air pollutants of greatest concern in the Basin are ozone, oxides of nitrogen, carbon monoxide, and fine particulate matter (PM_{10}), with the SCAB a federal non-attainment area for these pollutants. The EPA has identified six air pollutants as being of concern nationwide: carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x), ozone (O_3), particulate matter (PM_{10}), and lead. These pollutants are collectively referred to as criteria pollutants. The pollutant sources, effects on human health, and final deposition into the atmosphere vary considerably. CO is a colorless and an odorless gas. In high concentrations, CO can incapacitate the red blood cells and interfere with their ability to carry oxygen to body

tissues. Vehicular sources account for over 95 percent of the region's CO emissions. Particulate matter includes both liquid and solid particles of a wide range of sizes and composition. The principal health effect of the airborne particulate matter is on the respiratory system, although PM_{10} has been associated with carcinogenic effects. Particulate matter in the form of fugitive dust mainly results from demolition, excavation/grading, and earth moving equipment.

Both the federal government, through the U.S. Environmental Protection Agency (EPA), and California, through CARB, set ambient air standards to protect public health and welfare. Regionally, the South Coast Air Quality Management District (SCAQMD) and the Southern California Association of Governments (SCAG) prepare the Air Quality Management Plan (AQMP), which contains measures to meet state and federal requirements. When approved by CARB and the federal EPA, the AQMP becomes part of the State Implementation Plan (SIP).

3.4.3 Federal Attainment Status

The Basin, the nation's only "extreme" O_3 non-attainment area, has until 2010 to achieve the national 1-hour ozone standard. Deadlines for CO and PM_{10} attainment in the Basin are 2000 and 2005, respectively. The national NO_2 standard was regularly exceeded in Los Angeles County until 1992; however, the standard has not been exceeded since 1992 and the EPA redesignated the Basin attainment in 1998. The EPA has authority under the Clean Air Act to withhold some federal funds and to prepare plans for regions that do not meet the attainment deadlines.

In July, 1997, the EPA promulgated stricter standards for ozone and fine particulates ($PM_{2.5}$), with up to 15 years allowed for attaining the $PM_{2.5}$ standard. Attainment of the new 8-hour ozone standard is not required until after the 1-hour standard is achieved. The PM_{10} standard was not changed. Until there has been sufficient monitoring for the EPA to designate the attainment status for each region, the PM_{10} standard will remain the particulate standard of reference.

3.4.4 State Standards

The California Clean Air Act (CAL-CAA) was signed into law on September 30, 1988, became effective on January 1, 1989, and was amended in 1992. California has established ambient air standards for the same pollutants regulated nationally. The CAL-CAA requires, beginning on December 31, 1994, and every three years thereafter, that each air quality district in the state demonstrate the overall effectiveness of its air quality program. Under the act, each district must design its Air Quality Management Plan (AQMP) to achieve a reduction in basin-wide air pollutant emissions of five percent or more per year (15 percent or more in a three-year period) for non-attainment pollutants or their precursors. In addition, California has established standards for several additional pollutants. California standards are generally stricter than national standards for the same pollutants, but there is no penalty for failure to attain the state standards. California and national ambient air standards are shown on Table 5.

3.5 Hazardous Waste

Geocon Environmental Consultants Inc. performed a Site Investigation along Route 1 from Fiji

TABLE 5
AMBIENT AIR QUALITY STANDARDS

	State	National	
Air Pollutant	Standard	Primary	Secondary
Ozone (O_3)	>0.09ppm , 1-hr. avg.	>0.12 ppm, 1-hr. avg. 0.08 ppm, 1-hr. avg.	>0.12 ppm, 1-hr. avg.
Carbon Monoxide (CO)	>9.0 ppm, 8-hr. avg. > 20 ppm, 1-hr. avg.	>9 ppm, 8-hr. avg. >35ppm, 1-hr. avg.	>9 ppm, 8-hr. avg. >35 ppm, 1hr. avg.
Nitrogen Dioxide (NO_2)	>0.25 ppm, 1 hr. avg.	>0.0534 ppm, annual avg.	>0.0534 ppm, annual avg.
Sulfur Dioxide (SO_2)	>0.25 ppm 1-hr. >0.04 ppm, 24-hr. avg.	>0.03 ppm, annual avg. >0.14 ppm, 24-hr. avg.	>0.50 ppm, 3-hr. avg.
Suspended Particulate Matter (PM_{10})	>50$\mu g/m^3$, 24-hr. avg. >30 $\mu g/m^3$, AGM	>150 $\mu g/m^3$, 24-hr. avg. >50 $\mu g/m^3$ AAM	>150 $\mu g/m^3$, 24-hr. avg. >50 $\mu g/m^3$ AAM
Sulfates (SO_4)	>25 $\mu g/m^3$, 24-hr. avg.		
Lead (Pb)	>1.5 $\mu g/m^3$, monthly avg.	>1.5 $\mu g/m^3$, calendar quarter	>1.5 $\mu g/m^3$
Hydrogen Sulfide (H_2S)	>0.03 ppm, 1-hr. avg.		
Vinyl Chloride	>0.010 ppm, 24-hr. avg.		
Visibility-Reducing Particles	In sufficient amount to reduce prevailing visibility to less than 10 miles at relative humidity less than 70%, 1 observation		

Note: ppm = parts per million by volume
> = greater than
$\mu g/m^3$ = micrograms per cubic meter
AAM = annual arithmetic mean
AGM = annual geometric mean

Source: SCAQMD 1997 Air Quality Data

Way to the Culver Boulevard Overcrossing (October 2000). It was determined (under the anticipated new variance) that the exposed soil one meter from the edge of the pavement, as well as the exposed soil at the base of the columns of the Culver Boulevard Overcrossing, contained Total Lead concentrations below the threshold of 350mg/Kg and soluble lead concentrations above the threshold of 5mg/L for samples collected (up to a depth of 0.9m). Therefore, the excavated soil within the project limits (Jefferson Boulevard to Fiji Way) may be re-used on site, provided that a 0.3m of imported clean soft cover soil is used.

Another item of concern is the nearby Tosco/76 Service Station owner's continuing effort to monitor and recover the presence of liquid phase hydrocarbons from the groundwater impacted by leaking underground storage tanks (the proximity of the station is approximately 1,000 feet northwest of the project site). The Regional Water Quality Control Board records did not indicate the extent of the plume. Thus, a task order is in progress to test and evaluate the existing groundwater quality around the project site. The results of the sampling and testing may take 60 to 90 days to complete.

3.6 Biological Resources

The project is located in a topographically flat area adjacent to the Ballona Creek, which was previously a tidally influenced wetland prior to the creation of the Ballona Creek Flood Control Channel. Overall however, the habitat is disturbed, with an abundance of exotic vegetation present. The vegetation is dominated by ruderal species, including castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca),* black mustard (*Brassica nigra*), sow thistle (*Sonchus oleraceus*), telegraph weed (*Heterotheca* sp.), and Jimson weed (*Datua metloides*). Sparse native vegetation includes Laurel sumac (*Rhus laurina*), coyote bush (*Baccharis pilularis*), and California poppy (*Eschscholzia calfornica*)

There is minimal value of this land as a wildlife corridor due to the disturbed nature of the project location. However, there is a potential for bats and swallows at the Ballona Creek Bridge.

Within the project area, the Ballona Creek itself is soft bottom with a constant source of water, lacking vegetation, and at an elevation less than 25 feet above sea level. The Marina Ditch is a soft bottom blue-line stream located just south of Fiji Way. It is a man made drainage ditch with tidal influences, containing wetland/riparian vegetation on both the east and west sides of Route-1.

3.7 Land Use and Planning

Land uses within the project limits include undeveloped land, some of which is currently being developed, stretching nearly the entire length between Fiji Way and Jefferson Boulevard, with commercial properties beginning immediately south of Fiji Way, within the project limits.

The land is zoned commercial east of Lincoln Boulevard, between Jefferson Boulevard and Fiji Way, with some land zoned residential in the vicinity of Fiji Way. West of Lincoln Boulevard, between Jefferson Boulevard and the Ballona Creek Flood Control Channel, the land is zoned

residential. West of Lincoln Boulevard between Fiji Way and the Ballona Creek Flood Control Channel, the land is zoned agricultural.

The proposed project area is located within the City of Los Angeles. Lincoln Boulevard traverses in a north-south direction. The Los Angeles International Airport (LAX) is located approximately 1.6 to 2.4 km (1 to 1½ miles) to the south of the project area; the Marina del Rey Small Craft Harbor is approximately 0.4 km (1/4 mile) to the west; the City of Santa Monica is approximately 4.8 km (3 miles) to the north; and the nearest parts of Culver City are located approximately 1.6km (1 mile) to the east. To the Southeast of the project, less than 1.6km (1 mile), is Loyola Marymount University, while immediately to the north and northwest is the Marina del Rey area. This area contains a mixture of high-rise office space, low-rise commercial space, multi-family condominium and apartment buildings, and the small craft harbor. To the south, development includes vacant land owned by Catellus Residential on the Westchester bluffs, Loyola Marymount University along the bluffs adjacent to Lincoln Boulevard, and LAX.

Furthermore, the project is located near four major land use development proposals that are in various stages of the entitlement process. First, the Playa Vista development is the largest of the three development proposals. It includes 3,246 dwelling units and approximately 280,000 square meters of commercial land use. Master planning for Phase II of the development is currently underway. Secondly, there is the Marina del Rey LCP, which will increase recreational uses in the study area. These proposed revisions have been approved by the County Board of Supervisors and are being considered by the California Coastal Commission.

Thirdly, the "West Bluff Development" is a proposed 119 residential unit development on approximately 44-acres atop the last undeveloped Ballona Bluff. On August 11, 2000, the California Coastal Commission unanimously voted to deny permits to the developer, Catellus Development Corporation, which in turn nullified the Coastal Development Permit issued by the City of Los Angeles on February 24, 1999. As a result of the Coastal Commission's action, Los Angeles Superior Court Judge, the Honorable Judge David P. Yaffe, ruled that the challenge made against the Environmental Impact Report and Subdivision would be stayed.

Finally, the LAX Master Plan revisions, which are intended to expand the airport uses south of the project area in order to allow the airport to keep pace with the anticipated growth in air travel.

3.8 Social and Economic Resources

The residential areas in the vicinity of the proposed project consist of mainly middle to upper middle class households. The median household income is approximately $45,379, which is much higher than the averages for the City of Los Angeles ($30,925) and the County of Los Angeles ($34,965). Minority populations are also lower in this area compared to the City of Los Angeles. In this area, minority groups constitute approximately 22.7%, while for the City of Los Angeles, minorities total approximately 63% (U.S. Census Data, 1990).

"Minority" is defined as individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander, Black, not of Hispanic origin; or Hispanic. (CEQ 1997:19)

No residences, private or commercial properties, are expected to be impacted by the proposed project. It is the policy of the California State Department of Transportation, in accordance with the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Title 49 CFR Part 21, Executive Order 12898 regarding Environmental Justice in minority and low income populations, and related statutes and regulations that no person in the State of California, shall, on the grounds of race, color, sex, age, national origin, religion, or disabling condition, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity administered by or on behalf of the California State Department of Transportation (See Section 9 – Title VI Statement).

3.9 Public Services and Facilities

Public services and facilities include schools, fire stations, police stations, and parks and recreational facilities. Fire prevention, fire suppression, and life safety services are provided throughout the City of Los Angeles by the Los Angeles City Fire Department. The Los Angeles Police Department provides police protection services throughout the City of Los Angeles. The Los Angeles Unified School District provides primary and secondary public education services for the project area. Parks and recreational facilities in the project vicinity are operated by the City of Los Angeles Recreation and Parks Department, the Los Angeles County Parks and Recreation Department, the Culver City Parks and Recreation Division, and the State Parks and Recreation Department. Library services in the City of Los Angeles are provided by the Los Angeles City Public Library. There are no schools, fire stations, or police stations along the proposed Route 1 project segment.

3.10 Cultural Resources

The project site is near both a highly urbanized area as well as areas of undeveloped and newly developed land. The nearby areas of vegetation have been identified as part of the Ballona Wetland Marsh Area. The project is located in the ethnographic and historic territory traditionally identified as being inhabited by the Gabrielino/Tongva. The archaeological survey methodology included a windshield survey of most of the area, with walkovers of open areas in 3-meter increments. While CA-LAn-1018, SR-11, and CA-LAn-63 are archaeological sites, they occur outside the APE. Based on these findings, a Negative Archaeological Survey Report (ASR) was prepared as the appropriate technical study for the proposed project.

To identify historic and archaeological resources, an Area of Potential Effect (APE) was established in consultation with the Federal Highway Administration (FHWA). Because of the minimal nature of the project, the APE coincides with the project limits. It was found that as part of the 1986 Caltrans Historic Bridge Inventory, the Ballona Creek Bridge (1937), Culver Boulevard Overcrossing (1933), and Marina Ditch Bridge (1932) were determined to be not eligible for the National Register of Historic Places. These bridges were re-evaluated by a

qualified architectural historian in the course of environmental studies for the proposed project and the findings of non-eligibility continue to be valid.

3.11 Visual

Visual resources of the project site and surrounding areas are a function of both the natural and the built environment. Resources associated with the natural environment include the Westchester bluffs, the Pacific Ocean, and the Ballona Wetlands. The built environment includes the development along the sides and tops of the Westchester and Playa del Rey bluffs, the communities of Playa del Rey and Marina del Rey, the Marina del Rey small craft harbor, and the neighboring commercial and industrial developments.

3.12 Noise

3.12.1 Fundamentals of Traffic Noise

Traffic noise typically results from the interaction of the sources (moving vehicles) and the roadway. A considerable portion of traffic noise derives from the sound emitted by the combustion engines of these vehicles. From the source to the receiver, noise changes both in level and frequency.

Sound pressure level (SPL) is the measurement of the change in air pressure caused by the noise emitted by a source. The decibel (dB) unit is used to express SPL. Decibels are logarithmic units of ratios of actual sound pressures to a reference pressure squared. The standardized reference pressure is 20 micro Pascals which is the absolute threshold of hearing in healthy young adults.

Since decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces an SPL of 70 dB when it passes by an observer, two automobiles passing simultaneously do not produce 140 dB. They combine to produce an SPL of 73 dB.

From the source to the receiver, noise changes both in level and frequency. Noise decreases as the distance from the source increases. The rate of decrease depends on the following important factors:

- Geometric spreading from point and line sources
- Ground absorption
- Atmospheric effects and refraction
- Shielding by natural and manmade features, noise barriers, diffraction, and reflection.

Sound levels attenuate at a rate of 6 dBA for each doubling of the distance from a stationary source. This occurs because the energy of sound per unit area decreases due to the geometric spreading of its spherical pattern. Highway traffic noise, however is not a single, stationary point source of sound. The movement of the vehicle make the source of the sound appears to emanate from a line rather than a point when viewed over some time interval. Since the change in surface area of a cylinder only increases by two times for each doubling of the distance from the source

instead of the four times associated with spheres, the change in sound level is 3 dBA per doubling of distance.

The characteristics of the surface between the source and the receiver dictate whether ground absorption or noise reflection will occur. Grounds with a reflective surface are considered hard sites. Parking lots and smooth bodies of water are typical examples. No excess ground attenuation is assumed for such sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the line source or 3 dBA per doubling of distance. Soft sites have an absorptive ground surface such as soft dirt, turf or scattered bushes and trees. An excess ground attenuation value of 1.5 dBA per doubling of distance is then assumed resulting in an overall drop-off rate of 4.5 dBA per doubling of distance.

Atmospheric conditions can affect the propagation of traffic noise within 60 m from a highway. Wind, air temperature and humidity are the factors that have the most significant effects. A 10 km/hr cross wind can increase noise levels at 75 m by about 3 dBA downwind, and reduce noise by about the same amount upwind. Temperature variations with respect to elevation from ground level also affect noise propagation. Decreasing temperatures, as height increases, results in lower noise levels. The converse occurs when temperature increases, the noise increases as well.

Large objects between the source and the receiver can significantly attenuate noise levels. The amount of attenuation depends on the size of the obstruction. Trees and vegetation may provide up to 5-dBA reduction per every strip 5 m high and 30 m wide. The reduction limit is 10 dBA as sound passes over the treetops and gets refracted back to the surface by the previously discussed atmospheric conditions.

First row buildings generally provide up to 3-dBA noise level reduction for the first row, and 1.5 dBA for each additional row. As in the case of vegetation, the attenuation limit is 10 dBA. Man-made noise barriers are either walls or earth berms specifically constructed to reduce noise.Human hearing is most sensitive to sounds of frequencies between 1 KHz and 5 KHz. Higher and lower frequency sounds are perceived, albeit with less intensity. This is the reason why sound pressure level alone is not a reliable indicator of loudness, as perceived by people. The frequency or pitch of sounds has a substantial effect on how humans respond. In order to approximate the frequency response of the human ear, a series of sound pressure level adjustments is applied to the sound measured by a sound level meter. The A-scale was developed to approximate the frequency response of the average young ear. Studies have shown that when people make relative judgments of the nuisance value of noise they most often correlate with the A-scale sound level determined by a sound level meter.

A range of noise levels associated with common activities are shown in Table 6. Changes in noise levels are perceived as follows: 3 dBA barely perceptible, 5 dBA readily perceptible, and 10 dBA perceived as a doubling or halving of noise.

A number of descriptors have been devised by acousticians to rate noise on the basis of such things as annoyance, loudness, short term, long term, and by statistical levels. All Caltrans highway traffic noise analysis should be done in term of worst noise hour Leq(h) which is the

TABLE 6
TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL DECIBELS (dBA)	COMMON INDOOR ACTIVITIES
Jet fly-over at 300 m (1000 ft)	105	Rock Band
Gas lawn mower at 1 m (3 ft)	95	
Diesel truck at 15 m (50 ft) at 80 kph (50 mph)	80	Garbage disposal at 1 m (3 ft)
Noisy urban area, daytime	75	
Gas lawn mower, 30 m (100 ft)	70	Vacuum cleaner at 3m (10 ft)
Commercial area heavy traffic at 90 m (300 ft)	60	
Quiet urban, daytime	50	Dishwasher, adjacent room
Quiet urban, nighttime	40	Theater, large conference room
Quiet suburban, nighttime	35	Library, bedroom at night
Quiet rural, nighttime	25	
	10	Broadcast / recording studio
Lowest threshold of human hearing	0	Lowest threshold of human hearing

equivalent steady state noise level during the same period. In this descriptor the instant noise energy levels are averaged over a certain period of time. The result is the average energy which is converted back to a decibel level.

3.12.2 Affected Projects

Transportation projects affected by the Caltrans Traffic Noise Analysis Protocol are Type I projects. A Type I project is defined in Code of Federal Regulations 23 CFR, Part 772 as follows. A proposed Federal or Federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes.

3.12.3 Noise Abatement Criteria (NAC)

The FHWA Noise Abatement Criteria (NAC) are based on traffic characteristics which yields the noisiest hour $L_{eq}(h)$ for various land use activities. The NAC for different activity categories are presented in Table 7. A noisiest hour $L_{eq}(h)$ of 67 dBA for Activity Category B is applicable to the exterior of residential areas as well as parks and other recreational facilities. The noisiest hour $L_{eq}(h)$ of 72 dBA is applied to the exterior of commercial and industrial areas, which is Activity Category C.

3.12.4 Federal Requirements

National Environmental Policy Act (NEPA)

Under NEPA, impacts and measures to mitigate adverse impacts must be identified, including the identification of impacts for which no or only partial mitigation is possible.

Federal Highway Administration (FHWA) Regulations

Under FHWA regulations (23 CFR, Part 772), noise abatement must be considered for Type I projects when the project results in a substantial noise increase, or when the predicted noise levels approach or exceed the Noise Abatement Criteria (NAC). Noise abatement measures which are feasible and reasonable and that are likely to be incorporated in the project, as well as

noise impacts for which no apparent solution is available, must be identified and incorporated into the project's plans and specifications (23 CFR, Part 772.11 (e)(1) and (2)).

3.12.5 California Requirements

California Environmental Quality Act (CEQA)

Under CEQA, a substantial noise increase may result in a significant adverse environmental effect and, if so, must be mitigated or identified as a noise impact for which it is likely that no, or only partial abatement measures are available. Specific economic, social, environmental, legal, and technological conditions may make additional noise attenuation measures infeasible.

Street and Highways Code, Section 216

If, as a result of a proposed freeway project, noise levels in classrooms of public or private elementary or secondary schools exceed 52 dBA, Leq(h) the Department shall provide noise

TABLE 7
ACTIVITY CATEGORIES AND NOISE ABATEMENT CRITERIA (NAC)

Activity Category	*NAC Hourly A-Weighted Noise Level, dBA*	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 Exterior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

abatement to reduce classroom noise to the criteria or below. If the classroom noise exceeds the criteria before and after the freeway project, the Department shall provide noise abatement to reduce classroom noise to pre-project noise levels. The requirements are covered in the Streets and Highways Code, Section 216.

Noise Environment

The Office of Environmental Engineering and Feasibility Studies Noise Investigations Unit has reviewed the above referenced project regarding the improvements to Route 1. The initial review indicates that noise abatement is not necessary.

The widening of Route 1 falls under the Type I category of projects as defined by 23 CFR 772, under the increase of the number of through traffic lanes criteria. Section 2.7 of the October, 1998 Traffic Noise Analysis Protocol, indicates that a minimum 5-dBA noise reduction must be achieved at the impacted receivers in order for the proposed noise abatement measure to be considered feasible. Section 2.8 refers to reasonableness.

Under this criteria, the project does not qualify for noise abatement. Construction of a continuous soundwall would potentially impact the access to driveways or other types of entrances. Therefore noise abatement is not considered reasonable. Furthermore, if access openings were provided, then the soundwall would not achieve the minimum 5-dBA noise reduction, deeming the abatement not feasible. Fortunately however, there currently exist no residences within the project limits.